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US ARMY NICON SCIENTIFIC AND ENGINEERING SUPPORT
COMPUTATIONAL CAPABILITY (U) INTER SYSTEMS INC
ANNANDALE VA F BULCRAVE 15 NOV 85 DAAH03-85-C-0032

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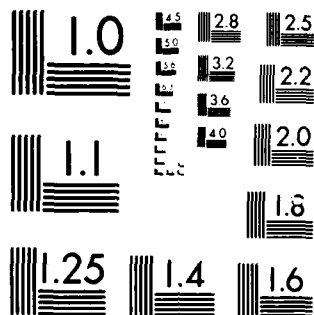
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U.S. ARMY MICOM SCIENTIFIC and ENGINEERING SUPPORT
COMPUTATIONAL CAPABILITIES REQUIREMENTS ANALYSIS
STUDY REPORT

VOLUME I MANAGEMENT OVERVIEW APPENDICES

OCTOBER 31, 1985

Prepared For: Commander
U.S. Army Missile Command
ATTN: AMSMI-WPA
Redstone Arsenal, AL 35898-5170

Contract No.: DAAH03-85-C0032
Subcontract No.: SBA-3-85-1-6298

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Inter Systems, Inc.

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
AD A 163381		
4. TITLE (and Subtitle) Scientific and Engineering Computing Requirements Definition and Analysis		5. TYPE OF REPORT & PERIOD COVERED ADP Study Report 1985-1995
7. AUTHOR(s) Bulcavage, Frank		6. PERFORMING ORG. REPORT NUMBER N/A
9. PERFORMING ORGANIZATION NAME AND ADDRESS Inter Systems, Inc. 7630 Little River Turnpike Annandale, VA 22003		8. CONTRACT OR GRANT NUMBER(s) DAAH03-85-C0032
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Missile Command ATTN: AMSMI-IM-SE Redstone Arsenal, AL 35898-5175		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS N/A
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Evaluation; Command; ADP; Technical; System Analysis; Requirements Definition; Telecommunications; Network; Computer; Software; Training; Cost Effective; Distributed Processing; Scientific and Engineering.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The basic questions addressed were what is the total near and long-term scientific and engineering computing requirements and what is the best way to effectively meet the requirements. The study identified and analyzed the re- quirements, developed alternatives for satisfying the requirements, and recommended cost effective approaches to satisfying the near and long-term requirements. The findings and recommendations were presented in an Executive Summary, Management Overview, and a Requirements Analysis Technical Report.		

APPENDIX A

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL

AMSMI-WS

SUBJECT

MICOM Scientific and Engineering Computing Requirements

TO

FROM AMSMI-W

DATE 27 FEB 1985

CMT 1

Mr. Whigham/fb/6-3831

AMSMI-F
AMSMI-D
AMSMI-R
AMSMI-S
AMSMI-U


AMSMI-Q
AMSMI-E
AMCPM-ADCC-X
AMCPM-HA
AMCPM-AMWS

AMCPM-HD
AMCPM-JM
AMCPM-RS
AMCPM-MD
AMCPM-CF

AMCPM-PE
AMCPM-MP
AMCPM-ROL
AMXTM-X
AMCPM-ATM

AMCPM-TO
AMSMI-Z
AMSMI-H

1. The CDC 6600 and CYBER 74 scientific computers have become outdated and need replacing. Over the past months there have been several discussions between Army Missile Laboratory and MISD personnel concerning present and future scientific computing requirements. In an effort to look ahead and properly plan for the future, we are in the early phase of defining requirements. As a part of this effort the commander has approved a MICOM Scientific and Engineering Computing Requirements Definition and Analysis Study. This study will be conducted through the use of a contractor under the auspices of MISD. The purpose of the study is to determine the near-term and long-term (10 years) scientific and engineering computing requirements in order to establish the sizes (e.g., micros, minis, supers), distribution of computers, terminals, communications networks, as well as software systems and packages required to meet the needs in the most efficient manner.
2. The contractor will be required to conduct surveys and interviews in each organization to gather data on existing and future applications and hardware. The data will be used to determine the overall requirements. Based upon the requirements and analyses, the contractor will recommend alternative configurations (hardware and networks) for meeting the near and long-term computing requirements of the command. The entire contract effort must be completed within six months from the effective date of the contract.
3. The definition of the computing requirements and the resulting analyses is quite complex. Much information will be needed. The contractor will ask that questionnaires be filled out to provide information about your applications, hardware, and software needs. Contractor personnel are required to have a SECRET security clearance to facilitate the information gathering process. It is imperative that the knowledgeable and proper people within your organization be made available to talk with the contractor if the analyses is to be of value.
4. Request a point of contact and one or more alternates, with phone numbers, be provided AMSMI-WS by 8 Mar 85. Responses may be sent via DDN message to Wwhigham or by DF.
5. The contractor will call your point of contact to set up appointments for interviews, surveys, etc. Since the entire effort (data/information collection, analyses, and alternative preparation) must be completed within the six-month time period, it is important that the personnel you select to provide information be available at the appointed time.
6. Your cooperation in this important command study is anticipated and appreciated.


WILLIE N. CALCOTE
Director of
Management Information Systems

APPENDIX B

ORGANIZATIONAL LEVEL QUESTIONNAIRE

U. S. ARMY MICOM SCIENTIFIC AND ENGINEERING COMPUTER SUPPORT
COMPUTATIONAL CAPABILITIES REQUIREMENTS ANALYSIS
ORGANIZATIONAL FUNCTION AND NEEDS ANALYSIS QUESTIONNAIRE

LAST REVISION DATE: MARCH 27, 1985

PREPARED FOR:

UNITED STATES ARMY MISSILE COMMAND

ORGANIZATION
OFFICE SYMBOL: _____

INITIAL INTERVIEW INFORMATION

DATE AND TIME SCHEDULED: _____

DATE AND TIME CONDUCTED: _____

BY: Inter Systems, Incorporated
7630 Little River Turnpike
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703-642-1600
and

Inter Systems, Incorporated
2614 Artie Street, Suite 21
Huntsville, Alabama 35805
205-536-8700

INSPECTED
3

Name <i>Little River</i>	
Location <i>Little River</i>	
Availability Codes	
Date	Avail and/or Special
<i>11</i>	

TIME PERIOD

[illegible]

1. Please identify the individuals who will participate in the initial interview of your organization. Please identify the name and title, organization office symbol, building number, room number and phone number.

PERSON NAME AND TITLE	ORGANIZATION			
	OFFICE SYMBOL	BLDG.#	ROOM#	PHONE#

2. Please identify other government individuals who will be able to contribute to the success of the command-wide Scientific and Engineering Computer Support Computational Capabilities Requirements Analysis, who may be contacted for follow-up interview sessions. Please identify their area of responsibility and reason they should be contacted. Examples of areas of responsibility and reasons are: directorate needs, division needs, branch needs, office needs, hardware, software, telecommunications, applications support, training, outside services or any other reasons that you feel are appropriate.

[illegible]

1.	PERSON NAME,	1.	BLDG.#
2.	TITLE	2.	ROOM #
3.	OFFICE SYMBOL	3.	PHONE#

[illegible]

3. Contractor Points of Contact (Continued)

PERSON'S NAME,
TITLE, COMPANY NAME,
AND PHONE #

REASON TO CONTACT

SECTION 2: SIZE AND COMPLEXITY OF THE SCIENTIFIC AND ENGINEERING USER COMMUNITY

4. The following questions are designed to develop an appreciation for the size and complexity of the Scientific and Engineering User Community as it exists now and how it might develop over the near and long term. This information will be used to estimate manpower, equipment (configurations and capacities) and training needs.

The set of questions which follow should be answered on the separate, 8 1/2 by 14 inch legal size form with the title of: 4. PROFILE OF THE SIZE AND COMPLEXITY OF THE SCIENTIFIC AND ENGINEERING USER COMMUNITY.

The three general time periods considered are the Current Term, Near Term, and Long Term. These categories are used on the response form.

1. Current Term - Consider Current Term to mean the timeframe from the present time to the end of FY85.
2. Near Term - Consider Near Term to mean the timeframe from FY86 to FY89.
3. Long Term - Consider Long Term to mean the timeframe from FY90 to FY94.

Please review the response form to find additional important information concerning questions: 4-4, 4-5, 4-6, and 4-8.

Question# 4-1 Approximately how many people are in your organization now? What about the future? Please enter the total number by manpower type and time period.

Question# 4-2 Approximately what percentage of the total number of personnel identified in Question # 4-1 are computer users now? What about the future?

Question# 4-3 Approximately what percentage of the total number of personnel identified in Question # 4-1 use computers for Scientific and Engineering Computing Requirements?

Please enter the percentage of Scientific and Engineering Computing Users.

Question# 4-4 Approximately what percentage of the total number of personnel identified in Question # 4-1 are Scientific and Engineering Computing Users on computers or word processing hardware?

Please enter the percentages of Scientific and Engineering Computing Users on each level of hardware identified. Note that the percentage for each level of hardware is independent.

Question# 4-5 Approximately what percentage of the total number of personnel identified in Question # 4-1 need to use multiple vendor's mainframes or minicomputers or microcomputers for Scientific and Engineering needs?

Please enter the percentages of Scientific and Engineering Computing users who need to use multiple vendors hardware at each level of hardware identified. For example, 10% may use both CDC and IBM mainframes for their needs; 20% may use both VAX and Data General minicomputers; 30% may use both IBM and Hewlett Packard microcomputers; 2% may use both Wang and CPT word processing equipment.

Question# 4-6 Approximately what percentage of the total number of personnel identified in Question # 4-1 need to use multiple combinations of levels of hardware for Scientific and Engineering needs?

Please enter the percentages of Scientific and Engineering Computing users who need to use multiple levels of hardware for the combinations of levels of hardware identified.

Question# 4-7 Approximately what percentage of the total number of personnel identified in Question # 4-1 use Supercomputers now for Scientific and Engineering Computing Requirements? What about the future?

Please enter the percentage of the people who are anticipated Supercomputer users.

Question# 4-8 Approximately what percentage of the total number of personnel identified in Question # 4-1 are using the identified sources for Scientific and Engineering Computing Requirements?

Please enter the percentages of Scientific and Engineering Computing Users who use the sources identified. Note that the percentage for each source is independent.

5. ENGINEERING DISCIPLINES MANPOWER REQUIREMENTS

Please circle all of the Engineering Disciplines that are applicable to your organization's mission accomplishment. Please estimate the current annualized level of support, in equivalent man-years, that is currently required to support each area. Also estimate the level of support that will be required over the near and long-term. For example, if your organization currently requires 100 man-years per year of support in Chemical Engineering, and over the near-term the level of support will grow by 10%, and over the long-term the annualized requirement will be an increase of 20% over what it is now; then 100 man-years would be entered under the CURRENT column, 110 would be entered under the NEAR-TERM column, and 120 would be entered for the LONG-TERM column.

ENGINEERING DISCIPLINES	EQUIVALENT MAN-YEARS OF EFFORT REQUIRED TO SUPPORT THIS AREA		
	CURRENT (FY85)	NEAR-TERM (FY86-FY89)	LONG-TERM (FY90-94)
1. Aerospace and Aeronautical Engineering	_____	_____	_____
2. Agricultural Engineering	_____	_____	_____
3. Chemical Engineering	_____	_____	_____
4. Civil Engineering	_____	_____	_____
5. Computer Science	_____	_____	_____
6. Electrical and Electronics Engineering	_____	_____	_____
7. Fire Protection Engineering	_____	_____	_____
8. Geotechnical Engineering	_____	_____	_____
9. Human Factors Engineering	_____	_____	_____
10. Industrial Engineering	_____	_____	_____
11. Material Science Engineering	_____	_____	_____
12. Mechanical Engineering	_____	_____	_____
13. Medical Engineering	_____	_____	_____
14. Nuclear Engineering	_____	_____	_____
15. Ocean and Marine Engineering	_____	_____	_____
16. Structural Engineering	_____	_____	_____
17. Water Resources Engineering	_____	_____	_____
18. Other (Specify)	_____	_____	_____

5. ENGINEERING DISCIPLINES MANPOWER REQUIREMENTS (Continued)

Please provide the breakdown of your current staff according to the MACARS Professional/Technical Elements Index. Please circle applicable Specialty Titles. For each Specialty Title, please indicate the number of individuals and equivalent man-years of each specialty that you need in order to accomplish your organization's mission currently and over the near-term and long-term.

MACARS PROFESSIONAL/TECHNICAL SPECIALTY TITLE	N U M B E R	EQUIVALENT MAN-YEARS OF EFFORT REQUIRED		
		CURRENT (FY85)	NEAR-TERM (FY86-FY89)	LONG-TERM (FY90-94)
1. Automatic Test Equipment	—	—	—	—
2. Chemistry	—	—	—	—
3. Command & Control Communications	—	—	—	—
4. Computers	—	—	—	—
5. Configuration Management	—	—	—	—
6. Cost & Schedule Analysis	—	—	—	—
7. Electro-Magnetic Radiation	—	—	—	—
8. Electronic Components	—	—	—	—
9. Fire Control	—	—	—	—
10. Ground Support Equipment	—	—	—	—
11. Guidance and Control	—	—	—	—
12. Human Factor Engineering (HFE)	—	—	—	—
13. Industrial/Management Engineering	—	—	—	—
14. Lasers	—	—	—	—
15. Materials	—	—	—	—
16. Mathematics	—	—	—	—
17. Metrology	—	—	—	—
18. Missile Dynamics	—	—	—	—
19. Nuclear Effects	—	—	—	—
20. Operations Research	—	—	—	—
21. Optics	—	—	—	—
22. Particle Beam	—	—	—	—
23. Product Assurance	—	—	—	—
24. Propulsion	—	—	—	—
25. Radar	—	—	—	—
26. Risk Analysis	—	—	—	—
27. Safety Engineering & Management	—	—	—	—
28. Seekers	—	—	—	—
29. Systems Design & Development	—	—	—	—
30. Systems Simulation	—	—	—	—
31. Systems	—	—	—	—
32. Targets	—	—	—	—
33. Telemetry	—	—	—	—
34. Test and Evaluation	—	—	—	—
35. Facilities Management	—	—	—	—
36. Instrumentation	—	—	—	—
37. Infrared and Electro-Optical Sensors	—	—	—	—
38. Structures	—	—	—	—

6. SCIENTIFIC AND ENGINEERING COMPUTATIONAL ANALYSIS METHODS

Please identify the Scientific and Engineering Computational Analyses that are performed by your organization. Please indicate the answers to the following questions by entering one of the numerical responses in the space provided for each question. Your responses to these questions will be used to help us understand how your computational needs are currently being satisfied and to identify areas in which additional software package capabilities might benefit your organization.

HOW PERFORMED QUESTIONS

Question #6-1 How is this type of analysis currently performed? Enter:

- 1 = By hand
- 2 = By canned software package alone
- 3 = By User generated code alone
- 4 = By User generated code accessing canned packages
- 5 = Mix of 1 to 4 above
- 6 = Not at all
- 7 = Don't Know

Question #6-2 How will this type of analysis be performed in the future?
Enter:

- 1 = By hand
- 2 = By canned software package alone
- 3 = By User generated code alone
- 4 = By User generated code accessing canned packages
- 5 = Mix of 1 to 4 above
- 6 = Not at all
- 7 = Don't Know

6. SCIENTIFIC AND ENGINEERING COMPUTATIONAL ANALYSIS METHODS (Continued)

<u>SCIENTIFIC AND ENGINEERING COMPUTATIONAL ANALYSIS</u>	<u>HOW PERFORMED?</u>	
	<u>QUESTION #</u>	
	<u>#6-1</u>	<u>#6-2</u>
1. Analysis of Variance	___	___
2. Basic Statistics	___	___
3. Categorized Data Analysis	___	___
4. Complex Arithmetic	___	___
5. Curve and Surface Fitting	___	___
6. Correlation and Regression Analysis	___	___
7. Determinants	___	___
8. Differential Equations and Differentiation	___	___
9. Eigenvalues and Eigenvectors	___	___
10. Forecasting, Econometrics, Time Series and Transforms	___	___
11. Generation and Testing of Random Numbers	___	___
12. Integral Equations	___	___
13. Interpolation, Approximation and Smoothing	___	___
14. Linear Algebraic Equations	___	___
15. Mathematical and Statistical Special Functions	___	___
16. Matrix Operations	___	___
17. Minimizing and Maximizing a Function	___	___
18. Non-parametric Statistics	___	___
19. Observation Structure, Multivariate Statistics	___	___
20. Operations Research	___	___
21. Orthogonalization	___	___
22. Quadrature	___	___
23. Random Number Generators	___	___
24. Regression Analysis	___	___

6. SCIENTIFIC AND ENGINEERING COMPUTATIONAL ANALYSIS METHODS (Continued)

SCIENTIFIC AND ENGINEERING COMPUTATIONAL ANALYSIS	HOW PERFORMED?	
	QUESTION #	
	#6-1	#6-2
25. Roots of One or More Transcendental Equations	_____	_____
26. Sampling	_____	_____
27. Simple Calculations on Statistical Data	_____	_____
28. Simultaneous Linear Equations	_____	_____
29. Summation of Series	_____	_____
30. Utility Functions	_____	_____
31. Vector, Matrix Arithmetic	_____	_____
32. Zeros and Extrema Linear Programming	_____	_____
33. Zeros of Polynomials	_____	_____
Please write in additional analyses that may not be covered above.		
34.	_____	_____
35.	_____	_____
36.	_____	_____
37.	_____	_____
38.	_____	_____
39.	_____	_____
40.	_____	_____
41.	_____	_____
42.	_____	_____
43.	_____	_____
44.	_____	_____
45.	_____	_____
46.	_____	_____
47.	_____	_____

7. APPLICATION INVENTORY

Please identify the application software systems that are used or will be used by your organization. Please identify which stage of the life cycle each system identified is in. Please identify a point of contact, for each application, in the organization responsible for the application software system. For stage enter the number corresponding to the life cycle phase that the system is in: 1=conceptualization, 2=Definition/Design, 3=System Development, 4=Operation, Deployment, Modification. Please enter the number for type which indicates: 1=Application is more Scientific and Engineering related, or 2=Application is more Business related, or 3=Application supports both the Scientific and Engineering, and Business areas. Please use a separate sheet if necessary.

APPLICATION SOFTWARE SYSTEM NAME AND IDENTIFICATION	S T T A Y G P E E			1. PERSON NAME,	1. BLDG. #
				2. TITLE	2. ROOM #
				3. OFFICE SYMBOL	3. PHONE #
A. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
B. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
C. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
D. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
E. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
F. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
G. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
H. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____
I. _____	_____	_____	_____	1. _____	_____
_____	_____	_____	_____	2. _____	_____
_____	_____	_____	_____	3. _____	_____

7. Application Inventory (Continued)

[illegible]

8. PROBLEM AREAS

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

8. PROBLEM AREAS (Continued)

What are the major problems that your organization has or is experiencing with the hardware, software or telecommunications capabilities that are being used by your organization? Please relate the specific problems to the appropriate machine configuration.

Discussion:

What are your organizations current and future plans for resolving the major problems identified above? Please include your suggestions as to what should be done about the problems identified.

Discussion:

9. ORGANIZATIONAL SENTIMENT TOWARDS SCIENTIFIC AND ENGINEERING COMPUTING ENVIRONMENT

The following questions are designed to develop a profile of organizational sentiment towards the Scientific and Engineering Computing Environment that is created by the currently available mix of hardware, software and telecommunications capabilities. Please indicate the response to each question at the intersection of a row (capability) and a column (question) on the matrices provided.

- Question #9-1 Does your organization need this type of capability on a mainframe, minicomputer, microcomputer? Enter Y=YES, N=NO, U=UNCERTAIN
- Question #9-2 Does this type of capability exist on mainframe, minicomputers and microcomputers that are currently available to your organization? Enter Y=YES, N=NO, U=UNCERTAIN
- Question #9-3 If this type of capability exists on any of the mainframes, minicomputers and microcomputers that are currently available to your organization, please indicate your organizations level of satisfaction with the capability that is available, where it is available. Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY else leave the cell on the matrix blank
- Question #9-4 How happy is your organization with the level of support provided for this capability by your own organizational resources? Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY
- Question #9-5 How happy is your organization with the level of support provided for this capability by the hardware vendors? Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY
- Question #9-6 How happy is your organization with the level of support provided for this capability by the software vendors? Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY
- Question #9-7 How happy is your organization with the level of support provided for this capability by contractors other than the hardware/software vendors themselves? Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY
- Question #9-8 How happy is your organization with the training provided for this capability? Enter 1=VERY HAPPY, 2=HAPPY, 3=UNHAPPY, 4=VERY UNHAPPY
- Question #9-9 How happy is your organization with the mainframes, minicomputers and microcomputers that are available for Scientific and Engineering computing? Enter 1=VERY HAPPY, 2=HAPPY, 3= UNHAPPY, 4=VERY UNHAPPY

SECTION 4: CURRENT AND FUTURE REQUIREMENTS

10. Please identify and characterize any manual or semi-automatic applications within your organization that are candidates for automation over the next ten years. Please provide some descriptions about the requirement and identify the individuals to contact who could discuss potential hardware, software and telecommunications requirements related to these applications and their impacts upon the existing computer center capabilities.

For example, "integrate report generation process" might be used to classify an application where a technical report representing the analysis of a series of simulation runs on the CDC computer is developed by a cut and paste and retyping process. It is required that word processing equipment be augmented with a data download/upload capability to speed up the report production process. Then it is necessary to distribute the technical report to different locations via an electronic mail system.

POINT OF CONTACT

1. Name

2. Title

3. Phone Number

REFERENCE

MANUAL APPLICATION DESCRIPTION

1. _____ A. _____
2. _____
3. _____

1. _____ B. _____
2. _____
3. _____

1. _____ C. _____
2. _____
3. _____

1. _____ D. _____
2. _____
3. _____

1. _____ E. _____
2. _____
3. _____

1. _____ F. _____
2. _____
3. _____

1. _____ G. _____
2. _____
3. _____

1. _____ H. _____
2. _____
3. _____

1. _____ I. _____
2. _____
3. _____

11. PROFILE OF HARDWARE AND SOFTWARE REQUIREMENTS

The following pages are designed to develop a profile of your organization's use of computers, programming languages, scientific, engineering and other software packages. The broad categories are DATABASE MANAGEMENT PACKAGES, GRAPHICS PACKAGES, ENGINEERING PACKAGES, PROGRAMMING LANGUAGES, PROJECT MANAGEMENT PACKAGES, SCIENTIFIC SOFTWARE LIBRARIES, SIMULATION/MODELING PACKAGES, STATISTICAL ANALYSIS PACKAGES, WORD PROCESSING PACKAGES, PERSONAL COMPUTER COMMUNICATION SOFTWARE PACKAGES AND CAD/CAM & FACTORY AUTOMATION PACKAGES.

On each of the survey response matrices for question 11, please enter the mainframes, minicomputers, and microcomputers that you use or plan to use. At the intersection of a computer and software capability on the chart, please enter the appropriate usage rating code which best describes your current and planned usage of the particular hardware and software combination. The usage rating code composition is described below:

The usage rating code is a three digit code composed of the combination of the answers to three questions. The three questions are as follows:

- 1) Does your organization use the hardware/software combination represented in the cell of the chart? 1 = yes, 2 = no. Thus, the first digit of the three digit code is always a 1 or 2.
- 2) Does your organization plan to or would like to use the hardware/software combination represented in the cell of the chart? 1 = yes, 2 = no. Thus, the second digit of the three digit code is always a 1 or 2.
- 3) How important is this hardware/software combination to your organization? 1 = Very Important, 2 = Important, 3 = Marginally Important, 4 = Not Important At All. Thus, the third digit of the three digit code is always 1, 2, 3 or 4.

For example, if an organization is currently using mainframe A and software package #6, and will use it in the future and it is very important to have access to this hardware/software combination; then, a three digit code of 111 would be entered in the cell of the matrix at the intersection of mainframe A and software package #6.

Another example would be: if an organization used a hardware/software combination in the past and did not plan to use it in the future because it was marginally important, then, a code of 123 would be appropriate.

Another example would be: if an organization needs to use a CDC or CRAY supercomputer for some FORTRAN modeling in the future and currently doesn't have access to one and the CRAY and FORTRAN capability is very important to the organization; then, a code of 211 would be appropriate. The code of 211 would be entered on the survey response form for Programming Languages, at the intersection of the line, where you wrote in CRAY for the mainframe and the column for FORTRAN.

If a cell is left blank on a line where a mainframe, minicomputer or microcomputer was entered the default response will be 224. This will mean that your organization doesn't use the software now, doesn't plan to use it in the future and that particular hardware/software combination is not important at all.

12. MAINFRAME AND MINICOMPUTER INVENTORY

Please provide an inventory of the mainframe and minicomputer hardware under your organization's control. Please indicate the manufacturer, model, operating system and current quantity. Also, indicate the planned acquisition of mainframes and minicomputers over the next nine fiscal years. Enter the current quantity under YEAR 1, which represents FY85. If the projected vendors are unknown, please specify UNKNOWN; but, still estimate the projected quantities. They are important to the study effort for network planning.

Please estimate in thousands of dollars the purchase, lease, operations and maintenance costs for planned acquisitions.

MANUFACTURER,
MODEL, AND
OPERATING SYSTEM

CURRENT QUANTITY AND PROJECTED ACQUISITIONS										
YEAR	1	2	3	4	5	6	7	8	9	10

MAINFRAMES:

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

MINICOMPUTERS:

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	5
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13. MICROCOMPUTER INVENTORY

Please provide an inventory of the microcomputer hardware under your organization's control. Please indicate the manufacturer, operating system and current quantity. Also, indicate the planned acquisition of microcomputers over the next nine fiscal years. Enter the current quantity under YEAR 1, which represents FY 85. If the projected vendors are unknown, please specify UNKNOWN; but, still estimate the projected quantities. They are important to the study effort for network planning.

Please estimate in thousands of dollars the purchase, lease, operations and maintenance costs for planned acquisitions.

MANUFACTURER,
MODEL, AND
OPERATING SYSTEM.

CURRENT QUANTITY AND PROJECTED ACQUISITIONS										
YEAR	1	2	3	4	5	6	7	8	9	10

MICROCOMPUTERS:

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

14. WORD PROCESSING INVENTORY

Please provide an inventory of the word processing hardware under your organization's control. Please indicate the manufacturer, operating system and current quantity. Also, indicate the planned acquisition of word processing equipment over the next nine fiscal years. Enter the current quantity under YEAR 1, which represents FY 85. If the projected vendors are unknown, please specify UNKNOWN; but, still estimate the projected quantities. They are important to the study effort for network planning.

Please estimate in thousands of dollars the purchase, lease, operations and maintenance costs for planned acquisitions.

MANUFACTURER,
MODEL, AND
OPERATING SYSTEM

CURRENT QUANTITY AND PROJECTED ACQUISITIONS										
YEAR	1	2	3	4	5	6	7	8	9	10

WORD PROCESSING:

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:
LEASE COST ESTIMATE:
OPERATIONS COST ESTIMATE:
MAINTENANCE COST ESTIMATE:

(continued)

15. COMPUTER TERMINAL INVENTORY

Please provide an inventory of the computer terminals under your organization's control. Please indicate the manufacturer, model, operating system (if appropriate) and current quantity. Also, indicate the planned acquisition of terminals over the next nine fiscal years. Enter the current quantity under YEAR 1, which represents FY 85. If the projected vendors are unknown, please specify UNKNOWN; but, still estimate the projected quantities. They are important to the study effort for network planning.

Please estimate in thousands of dollars the purchase, lease, operations and maintenance costs for planned acquisitions.

MANUFACTURER,
MODEL, AND
OPERATING SYSTEM.

CURRENT QUANTITY AND PROJECTED ACQUISITIONS										
YEAR	1	2	3	4	5	6	7	8	9	10

COMPUTER TERMINALS

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

16. COMMUNICATIONS HARDWARE INVENTORY

Please provide an inventory of the communications hardware under your organization's control. Please indicate the manufacturer, model and characteristics of each device class. Enter the quantity to be in place by the end of YEAR 1, which is FY 85; and estimate the number of devices to be acquired over the next nine fiscal years. If the vendors are unknown, please specify UNKNOWN; but, still estimate the projected quantities. They are important to the study effort for network planning.

Please estimate the purchase, lease, operations and maintenance costs for planned acquisitions.

COMMUNICATIONS DEVICE
MANUFACTURER MODEL
AND CHARACTERISTICS*

CURRENT QUANTITY AND PROJECTED ACQUISITIONS										
YEAR	1	2	3	4	5	6	7	8	9	10

MODEMS:

[illegible]

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

* Characteristics: speed, duplex, synchronization

16. Communications Hardware Inventory (Continued)

COMMUNICATIONS DEVICE
MANUFACTURER MODEL
AND CHARACTERISTICS*

CURRENT QUANTITY AND PROJECTED ACQUISITIONS
YEAR 1 2 3 4 5 6 7 8 9 10

MULTIPLEXORS:

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

COMMUNICATIONS PROCESSORS:

COST ESTIMATES (\$1,000'S):

PURCHASE COST ESTIMATE:

LEASE COST ESTIMATE:

OPERATIONS COST ESTIMATE:

MAINTENANCE COST ESTIMATE:

* Characteristics: speed, duplex, synchronization

17. COMMUNICATIONS LINES/CIRCUITS INVENTORY

Please provide a complete inventory of the current dedicated and dial-up communications lines/circuits available to your organization. Enter the number of lines/circuits that will be in place by the end of FY 85 (YEAR 1) and estimate the number of lines/circuits that will be added during each of the next nine fiscal years.

Please estimate in thousands of dollars the purchase, lease, operations and maintenance costs for planned acquisitions.

[illegible]

18. TRAINING REQUIREMENTS

Please comment on your organization's current, near-term (5 years), and long-term (10 years) training requirements in the following areas. Please identify specific topics and quantify the number of individuals to be trained.

COMPUTER LANGUAGES TRAINING REQUIREMENTS:

SCIENTIFIC AND ENGINEERING APPLICATION SOFTWARE TRAINING REQUIREMENTS:

TELECOMMUNICATIONS TRAINING REQUIREMENTS:

SUBJECT MATTER TRAINING REQUIREMENTS:

OTHER TRAINING REQUIREMENTS:

19. MISD SERVICES REQUIRED

Please discuss the types of services that you would like MISD to provide to your organization in order to support your organization's mission accomplishment.

Discussion:

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

20. ORGANIZATION'S OWN CAPABILITY DEVELOPMENT

Please discuss the types of data processing capabilities that your organization will develop to satisfy the needs that are not or will not be provided by MISD. Please explain how this will be done.

Discussion:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

This completes the structural part of the interview concerning your organization. Thank you for your time and cooperation. We will now open up the interview session for general discussion.

THIS IS THE END OF THIS SURVEY INSTRUMENT

ORGANIZATIONAL FUNCTION AND NEEDS ANALYSIS QUESTIONNAIRE FEEDBACK SHEET

Please express your opinions and impressions concerning this questionnaire, the conduct of the interview, the individuals conducting the interview, the requirements analysis or anything else your group would like to comment on. Your opinions, impressions, comments and criticisms are welcome. Please forward this sheet to Inter Systems Inc. in the envelope provided. Thank you for your inputs. If you wish to be contacted regarding your inputs, please indicate your name and phone number on this sheet.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

PROFILE OF THE SIZE AND COMPLEXITY OF THE SCIENTIFIC AND ENGINEERING USER COMMUNITY

CURRENT, NEAR-TERM AND LONG-TERM USER POPULATION PROFILES

BY MANPOWER RESOURCES TYPE AND HARDWARE

	4-1 HOW MANY	4-2 WHAT % 0-100%	4-3 WHAT % 0-100%	4-4 WHAT % 0-100%			4-5 WHAT % 0-100%			4-6 WHAT % 0-100%			4-7 WHAT % 0-100%			4-8 WHAT % 0-100%		
				A	B	C	D	A	B	C	D	E	F	G	H	I	J	K
1. CURRENT:																		
A. Civilians																		
B. Military																		
C. Contractor																		
2. NEAR TERM:																		
A. Civilians																		
B. Military																		
C. Contractor																		
3. LONG-TERM:																		
A. Civilians																		
B. Military																		
C. Contractor																		

4-4 and 4-5 HARDWARE LEVELS	4-6 MULTIPLE COMBINATIONS OF HARDWARE LEVELS	4-8 IDENTIFIED SOURCES
A - Mainframe	F - Mainframes and Minicomputers	I - MICOM MISD Usage
B - Minicomputer	P - Mainframes and Microcomputers	J - MICOM Other Organization's Usage
C - Microcomputer	G - Minicomputers and Microcomputers	K - Your Own Organization
D - Word Processing	H - Mainframe, Minicomputers and Microcomputers	L - Outside Contractor Usage

RESPONSE FORM FOR QUESTION #9

ORGANIZATIONAL STATEMENT TOWARDS SCIENTIFIC AND ENGINEERING COMPUTING ENVIRONMENT

AA	9-1			9-2			9-3			9-4			9-5			9-6			9-7			9-8			9-9		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
A. Data Entry and Data Validation																											
B. Data Update																											
C. Formal Report Writing																											
D. Ad Hoc Query																											
E. Mechanisms for Data Security and Integrity																											
F. Programming and Data Manipulation																											
G. Financial Modelling																											
H. Graphic Support																											
I. Statistical Analysis																											
J. Personal Computer																											
BB	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
A. Database Mgt Systems																											
B. Engineering Packages																											
C. Graphics Packages																											
D. Programming Languages																											
E. Project Mgt Packages																											
F. Scientific Software Libraries																											
G. Statistical Packages																											
H. Simulation/Modeling Packages																											
I. Word Processing Packages																											
J. Communications Software Packages																											

AA - Scientific Applications AIP Support Capabilities
 BB - Scientific Applications Software Package Support Capabilities

A - Mainframes
 B - Minicomputers
 C - Microcomputers

SURVEY OF DATABASE MANAGEMENT SYSTEMS USED ON MICHIGAN HARBOR

DATABASE MANAGEMENT PACKAGES (Reference Legend Below)																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1.	MANIPULATES USED:																															
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																
2.	MANIPULATES USED:																															
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																
3.	MANIPULATES USED:																															
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																

- | | | | | | |
|------------------|------------------|---------------|---------------------|----------------|-----|
| 1. ALPHAS | 8. DTE | 15. IDS/R | 22. PC/FOUS | 29. TIS | 36. |
| 2. CA-PRODUCTIVE | 9. DECODAS/USING | 16. INFO | 23. PC/INQUIRE | 30. TOTAL | 37. |
| 3. CA-UNIVERSE | 10. DMS170 | 17. INQUIRE | 24. SERIES ONE PLUS | 31. X22 | 38. |
| 4. CREATRAGE | 11. EXPRESS | 18. MODEL 204 | 25. SHAP | 32. COLLENGATE | 39. |
| 5. DMS | 12. FOUS | 19. NOMAD | 26. SIR | 33. | 40. |
| 6. DATCOM | 13. FRANTS | 20. OLIVER | 27. STRIPS | 34. | 41. |
| 7. DBASE II/III | 14. IDS | 21. PC/PIPE | 28. SYSTEM 200 | 35. | 42. |

SURVEY OF ENGINEERING PACKAGES USED ON WHICH HARDWARE

ENGINEERING PACKAGES (Reference Legend Below)																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. MAINFRAMES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MINICOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MICROCOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | | |
|------------|------------------|------------|-------------|-----|
| 1. ARCADIS | 7. ELROM | 13. ROADS | 19. TURKJOY | 25. |
| 2. CIVCO | 8. FLUSH | 14. SAP | 20. | 26. |
| 3. CICO | 9. FLAKE | 15. SEROL | 21. | 27. |
| 4. CORON | 10. KFK IODINE | 16. SINCE | 22. | 28. |
| 5. CTAESBO | 11. LEACE | 17. STRESS | 23. | |
| 6. ECAP | 12. INSTRAN 17.5 | 18. STRUL | 24. | |

REFERENCE FOR QUESTION #11
SURVEY OF GRAPHICS PACKAGES USED ON WHAT HARDWARE

GRAPHICS PACKAGES (Reference Legend Below)																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. MINIFRAMES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MONITOR/PRINTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MICROPRINTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | | |
|------------------------------------|---------------------|-----|-----|-----|
| 1. CALCOMP | 7. TEKTRONIX PLOT10 | 13. | 19. | 25. |
| 2. DEC/RTA | 8. TEKTRONIX MGL218 | 14. | 20. | 26. |
| 3. DCL PLOTS | 9. VERSAPLOT | 15. | 21. | 27. |
| 4. INTERACTIVE DATA DISPLAY SYSTEM | 10. SIMAP | 16. | 22. | 28. |
| 5. NRC/DC GRAPHICS | 11. | 17. | 23. | |
| 6. SCIENTIFIC SUBROUTINE PACKAGE | 12. | 18. | 24. | |

REFERENCE FORM FOR QUESTION #11
 SURVEY OF PROGRAMMING LANGUAGES USED ON WHICH INQUIRE

PROGRAMMING LANGUAGES (Reference Legend Below)																															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. MAINFRAMES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MINICOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MICROCOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | |
|--------------|-------------|------------|-----|
| 1. ADA | 7. C | 13. PL/I | 19. |
| 2. ALGOL | 8. COBOL | 14. SIMULA | 20. |
| 3. APL | 9. CORAL-66 | 15. | 21. |
| 4. ASSEMBLER | 10. FORTRAN | 16. | 22. |
| 5. BASIC | 11. LISP | 17. | 23. |
| 6. BILIS | 12. PASCAL | 18. | 24. |
| | | | 25. |
| | | | 26. |
| | | | 27. |
| | | | 28. |

REFERENCE FORM FOR QUESTION #11

SURVEY OF PROJECT MANAGEMENT PACKAGES USED ON WHICH HARDWARE

PROJECT MANAGEMENT PACKAGES (Reference Legend Below)																																
1. MAINFRAMES USED:			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																

2. MICROCOMPUTERS USED:		
A.		
B.		
C.		
D.		
E.		
F.		

3. MICROCOMPUTERS USED:		
A.		
B.		
C.		
D.		
E.		
F.		

- | | | | | |
|---------------|----------------------------|----------------------|-----|-----|
| 1. VISION | 7. MICRO PEST | 13. ARTIMIS | 19. | 25. |
| 2. C/P | 8. PROJECT CONTROL PROGRAM | 14. PERT MASTER-1500 | 20. | 26. |
| 3. TRACK-50 | 9. PROJECT PLANNER | 15. OPTIMA 100 | 21. | 27. |
| 4. TRACE | 10. PROJECT MASTER | 16. PROUIT2 | 22. | 28. |
| 5. HARVARD-IM | 11. MUSEUM | 17. | 23. | |
| 6. PERTMASTER | 12. PEG-II | 18. | 24. | |

SURVEY OF SCIENTIFIC SOFTWARE LIBRARIES USED ON WHICH HARDWARE

SCIENTIFIC SOFTWARE LIBRARIES (Reference Legend Below)																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1. MAINFRAMES USED:																																
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																
2. MINICOMPUTERS USED:																																
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																
3. MICROCOMPUTERS USED:																																
A.																																
B.																																
C.																																
D.																																
E.																																
F.																																

- | | | |
|---|---------------------------------------|-----|
| 1. ARCADE LABS (EISPACK, MINPACK, LINPACK, MINPACK) | 7. NUMERICAL ALGORITHMS GROUP LIBRARY | 13. |
| 2. AEROSPACE RESEARCH LABS (LINEAR ALGEBRA LIBRARY) | 8. SCIENTIFIC SUBROUTINE PACKAGE | 14. |
| 3. INEL | 9. | 15. |
| 4. CIT MATH SCIENCE LIBRARY | 10. | 16. |
| 5. SANDIA LABS (DIFFERENTIAL EQUATIONS) | 11. | 17. |
| 6. MIT HIGH-SPINT | 12. | 18. |
| | 19. | 25. |
| | 20. | 26. |
| | 21. | 27. |
| | 22. | 28. |
| | 23. | |

SURVEY OF STATISTICAL PACKAGES USED ON WHICH INQUIRE

STATISTICAL ANALYSTS PACKAGES (Reference Legend Below)																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1. MAINFRAMES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MINICOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MICROCOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | | |
|------------------|--------|-----|-----|-----|
| 1. BMDP77 | 7. SUR | 13. | 19. | 25. |
| 2. NDI MATH-STAT | 8. TPL | 14. | 20. | 26. |
| 3. CAMTAS | 9. | 15. | 21. | 27. |
| 4. SAS | 10. | 16. | 22. | 28. |
| 5. SPSS | 11. | 17. | 23. | |
| 6. SSP | 12. | 18. | 24. | |

REPORT FORM FOR QUESTION #11
SERIES OF GENERAL PURPOSE SIMULATION/MODELING PACKAGES USED ON WHICH HARDWARE

SIMULATION/MODELING PACKAGES (Reference Legend Below)																															
1. MAINFRAMES USED:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

2. MINICOMPUTERS USED:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

3. MICROCOMPUTERS USED:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | |
|-------------------------|-----|-----|-----|
| 1. GPP - Continuous | 13. | 19. | 25. |
| 2. DYNAMO - Continuous | 14. | 20. | 26. |
| 3. GASP - Both | 15. | 21. | 27. |
| 4. GISS - Discrete | 16. | 22. | 28. |
| 5. MONTE - Continuous | 17. | 23. | |
| 6. SIMULA - Discrete | 18. | 24. | |
| 7. SIMSCRIPT - Discrete | | | |
| 8. SIFT - Discrete | | | |
| 9. MSL | | | |
| 10. SLAM | | | |
| 11. | | | |
| 12. | | | |

RESPONSE FORM FOR QUESTION #11
 SURVEY OF PERSONAL COMPUTER COMMUNICATION SOFTWARE USED ON MICHIGAN HARBOR

PERSONAL COMPUTER COMMUNICATION SOFTWARE PACKAGES (Reference Legend Below)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. MINIPACKS USED:																														
A.																														
B.																														
C.																														
D.																														
E.																														
F.																														
2. MINICOMPUTERS USED:																														
A.																														
B.																														
C.																														
D.																														
E.																														
F.																														
3. MICROCOMPUTERS USED:																														
A.																														
B.																														
C.																														
D.																														
E.																														
F.																														

- | | | | |
|--------------------------|------------------|-------------------------------------|--------------------------|
| 1. ACCESS with Autopilot | 6. Intelitem | 11. PC-Talk II | 16. Relay |
| 2. Arcos | 7. Micro Link II | 12. PC to Mac and Back | 17. Smartcom II |
| 3. EASYT | 8. RTT2/RS | 13. Perfect Talk | 18. Smartcom 100 |
| 4. Crosstalk | 9. RTem | 14. Personal Communications Manager | 19. The Japansator |
| 5. Data Capture | 10. Omibeam 2 | 15. Pfa:Acorn | 20. Transend PC Complete |

SURVEY OF WORD PROCESSING PACKAGES USED ON WHICH HARDWARE

WORD PROCESSING PACKAGES (Reference Legend Below)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. HARDWARES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MONITOR/PRINTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MICROCOMPUTERS USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

- | | | | | |
|----|-----|-----|-----|-----|
| 1. | 7. | 13. | 19. | 25. |
| 2. | 8. | 14. | 20. | 26. |
| 3. | 9. | 15. | 21. | 27. |
| 4. | 10. | 16. | 22. | 28. |
| 5. | 11. | 17. | 23. | |
| 6. | 12. | 18. | 24. | |

SURVEY OF CAD/CAM AND FACTORY AUTOMATION PACKAGES USED ON WHICH HARDWARE

CAD/CAM AND FACTORY AUTOMATION PACKAGES (Reference Legend Below)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. PACKAGES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
2. MEMORABLES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															
3. MEMORABLES USED:																															
A.																															
B.																															
C.																															
D.																															
E.																															
F.																															

25. 26. 27. 28.

19. 20. 21. 22. 23. 24.

13. 14. 15. 16. 17. 18.

7. 8. 9. 10. 11. 12.

1. 2. 3. 4. 5. 6.

APPLICATION LEVEL QUESTIONNAIRE

APPLICATION NUMBER: _____

U.S. ARMY MICOM SCIENTIFIC AND ENGINEERING COMPUTER SUPPORT
COMPUTATIONAL CAPABILITIES REQUIREMENTS ANALYSIS
SYSTEM APPLICATION SOFTWARE ANALYSIS QUESTIONNAIRE

LAST REVISION DATE: MARCH 7, 1985

PREPARED FOR:

UNITED STATES ARMY MISSILE COMMAND

BY: Inter Systems, Incorporated
7630 Little River Turnpike
Annandale, Virginia 22003
703-642-1600

and

Inter Systems, Incorporated
2614 Artie Street, Suite 21
Huntsville, Alabama 35805
205-536-8700

TIME PERIOD

[illegible]

1. Identify the Application Software System Name: _____

2. Identify the Purpose of the Application System: _____

3. Please identify the Functional Capabilities of the Application System:

4. Please identify the organizations responsible for the following application software system life cycle phases and major activities:

PHASE		GOVT. ORGANIZATIONS OR CONTRACTOR RESPONSIBLE (DIRECTORATE, DIVISION, BRANCH OR OFFICE)	CONTRACTOR INVOLVEMENT					
			PAST		PRESENT		FUTURE	
			Y	N	Y	N	Y	N
			E	O	E	O	E	O
			S		S		S	
I	Conceptualization							
	Government:							
	Contractors: A							
	B							
	C							
II	Definition/Design							
	Government:							
	Contractors: A							
	B							
	C							
III	System Development							
	Government:							
	Contractors: A							
	B							
	C							
IV	Deployment							
	Government:							
	Contractors: A							
	B							
	C							
V	Operation							
	Government:							
	Contractors: A							
	B							
	C							
VI	Configuration Management							
	Government:							
	Contractors: A							
	B							
	C							
VII	Maintenance/Modification							
	Government:							
	Contractors: A							
	B							
	C							

Please identify current individual(s) responsible for this application system
(Civilian or Military and Contractor)

<u>NAME</u>	<u>DIRECTORATE/DIVISION BRANCH OR COMPANY</u>	<u>CODE #</u>	<u>BLDG.#</u>	<u>ROOM #</u>	<u>PHONE #</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

5. Please identify the existence of the following software life cycle documentation for this application software system. Check yes or no. If yes, enter one of the adequacy indicators and write comments in the space provided. The meaning of the adequacy codes are: 1-Excellent, 2-Very Good, 3-Good, 4-Fair, 5-Poor, 6-Very Poor

<u>DOCUMENTATION AVAILABILITY</u>	<u>Y</u>	<u>N</u>	<u>ADEQUACY</u>	<u>COMMENTS</u>
<u>INFORMATION DOCUMENT TYPE</u>	<u>E</u>	<u>O</u>	<u>CODE</u>	
	<u>S</u>			
Concept Document	_____	_____	_____	_____
Functional Requirements Document	_____	_____	_____	_____
Data Requirements Document	_____	_____	_____	_____
System/Subsystem Specification	_____	_____	_____	_____
Program Specification	_____	_____	_____	_____
Data Base Specification	_____	_____	_____	_____
Users Manual	_____	_____	_____	_____
Operations Manual	_____	_____	_____	_____
Program Maintenance Manual	_____	_____	_____	_____
Test Plan	_____	_____	_____	_____
Test Analysis Report	_____	_____	_____	_____

6. Please identify which MICOM computers are used to run this application and provide the annualized computer timesharing cost to execute this application on the system utilized.

<u>MAINFRAME SYSTEM USED</u>	<u>OPERATING SYSTEM</u>	<u>ANNUALIZED TIMESHARING COST (THOUSANDS)</u>
Check <u>Here</u>		
A. ___ MISD CDC 6600 ___ AND CYBER 74	_____	_____
B. ___ Other (specify) _____	_____	_____
C. ___ Other (specify) _____	_____	_____
D. ___ Other (specify) _____	_____	_____
E. ___ Other (specify) _____	_____	_____

MINICOMPUTER SYSTEM USED	OPERATING SYSTEM	ANNUALIZED TIMESHARING COST (THOUSANDS)
A.		
B.		
C.		
D.		
E.		

7. If the application runs on a non-MICOM computer, please identify the non-MICOM organization or vendor who provides the computer resources.

	ORGANIZATION OR VENDOR	TYPE OF HARDWARE AND OPERATING SYSTEM VERSION/RELEASE	CURRENT ANNUALIZED COST
A.			
B.			
C.			
D.			

8. Please identify the programming languages that the application is coded in and the approximate lines of code by language used. Under Column A, please provide the number of Main Programs in the application. Under Column B, please provide the number of Subroutines or Function Subprograms that are called by the Main programs in the application. Main Programs are computer programs that are not callable by other computer programs. Subroutines or Function Subprograms are callable programs that are called by the main or Control Programs. The total number of computer programs that make up the application is represented under Columns A and B. Columns C through I are designed to provide some indication of the nature and complexity of the application. In Columns C through I, distribute the total number of programs/routines that were identified in Columns A and B into the categories that most closely represent the functional nature of the programs in the application.

APPLICATION CHARACTERISTICS # COMPUTER PROGRAMS AND PROGRAM CLASSIFICATIONS*

Programming Languages	# Lines Code	A	B	C	D	E	F	G	H	I
ADA										
ALGOL										
APL										
ASSEMBLER										
(specify)										
BASIC										
BLISS										
C										
COBOL										
CORAL-66										
FORTRAN										
LISP										
PASCAL										
PL/1										
SNOBOL										

- * Legend:
- A - Number of Main Programs
 - B - Number of Subroutines or Function Subprograms
 - C - Number of Graphics/Plotting Programs/Routines
 - D - Number of Data Entry, Input and Edit Routines
 - E - Number of Data Reduction Routines
 - F - Number of Update Programs/Routines
 - G - Number of Calculations and Processing Programs/Routines
 - H - Number of Report Generation Programs - Standard
 - I - Number of Report Generation Programs - Ad Hoc

- CHECK
HERE**

```

DBMS Packages (specify):
Engineering Packages (specify):
Graphics Packages (specify):
Project or Program Management (specify):
Scientific Software Libraries (specify):
Simulation/Modelling Packages (specify):
Statistical Analysis Packages (specify):
Other Special Purpose Languages or Packages (specify):
System Utilities (specify):
Personel Computer Software (specify):

```

For example, if there was a strange application that evolved over a period of time that used DMS 170, SYSTEM 2000, GPSS, SIMSCRIPT and SPSS, the following information might be available:

DMS 170 Query Update	-	4,000	lines of code,	200	procedures
SYSTEM 2000 NATURAL LANGUAGE	-	6,000	lines of code,	600	programs
SYSTEM 2000 REPORT WRITER	-	2,000	lines of code,	50	procedures
GPSS PROCEDURE	-	10,000	lines of code,	25	procedures
SIMSCRIPT	-	5,000	lines of code,	5	programs
SPSS Procedures	-	3,000	lines of code,	50	procedures

[illegible]

- С
Н
Е
С
К

[illegible]

	MANUFACTURER	MODEL	DEVICE NAME AND PURPOSE
A.			
B.			
C.			
D.			

[illegible]

12. Please characterize the overall operation of this application by entering the relative percentage of each functional feature that is accomplished through batch, interactive and real-time processing. The sum of the three percentages should equal 100%.

For example, if most of the data for a given application is obtained from punched cards and run through a batch program to create a data file; and, some of the data is entered into the system interactively; you might make a 95%, 5%, 0% estimate for the Data Entry Functional Feature Classification for the Batch, Interactive and Real-Time Processing Environment Percentages.

For example, if all of the Data Collection Functional Feature is accomplished in a real-time mode, the percentages would be 0%, 0% and 100%.

For example, if the Data Editing Feature is accomplished half in batch mode and half in an interactive mode, the percentages would be 50%, 50% and 0%.

PROCESSING ENVIRONMENT REQUIREMENTS PERCENTAGES

<u>FUNCTIONAL FEATURE CLASSIFICATION</u>	<u>BATCH %</u>	<u>INTERACTIVE %</u>	<u>REAL-TIME %</u>
Data Entry	—	—	—
Data Collection	—	—	—
Data Editing	—	—	—
Data Reduction	—	—	—
Data Update	—	—	—
Data Processing	—	—	—
Standard Reporting	—	—	—
Ad-Hoc Reporting	—	—	—
Graphics and Plotting	—	—	—
Other (Specify):	—	—	—
_____	—	—	—
_____	—	—	—
_____	—	—	—
_____	—	—	—

13. USER GROUP IDENTIFICATION

Which organizations are the user groups for this application? Please provide the information requested for all user groups of this system. Please identify the user group organizations down to the branch level where possible. Please identify knowledgeable points of contact who are actual users of this application or supervisors of actual users of this application. For each user group identified, please identify the number of users in the group who are actual users of this application.

	Directorate Division Branch Office Symbol	Bldg. #	Room #	Point of Contact	Phone #	# Users In Group
A.						
B.						
C.						
D.						
E.						
F.						
G.						
H.						
I.						
J.						
K.						
L.						
M.						
N.						
O.						
P.						
Q.						
R.						
S.						
T.						
U.						
V.						
W.						
X.						
Z.						

14. USER GROUP TECHNICAL INFORMATION

Please provide the following information for each user group identified for this application in #13 User Group Identification.

User Group Box	Directorate Division Branch Office Symbol	Bldg. #	Room #	Point of Contact	Phone#
_____	_____	_____	_____	_____	_____

For the identified user group, please provide the following terminal communication information.

- 1) Total # terminals available at user branch that are leased ____ purchased ____
- 2) Total # terminals at user branch that are dedicated to this application ____
- 3) Total # terminals out of dedicated terminals that are connected to this application via dedicated-line ____ or via dial-up ____
- 4) Total # terminals from the user branch that access this application that are connected via dedicated-line ____ or via dial-up ____
- 5) Maximum # of terminals from the user branch that ever will be connected to this application at the same time over the next 10 years. Year 1 is FY85. Also, please identify the connect hours requested across the maximum # of terminals identified for each year period.

YEAR:	1	2	3	4	5	6	7	8	9	10
Maximum # Terminals:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Peak Month Connect Hrs.:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Peak Day Connect Hrs.:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Average Month Connect Hrs.:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Average Day Connect Hrs.:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

- 6) What are the current and future core requirements for running this application in K-bytes or K-words for this user group? Please indicate K-bytes or K words as appropriate (i.e. 450K-bytes, 100K-words).

	CURRENT		FUTURE	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Interactive	_____	_____	_____	_____
Batch	_____	_____	_____	_____
Real-time	_____	_____	_____	_____

14. USER GROUP TECHNICAL INFORMATION (Continued)

- 7) How many interactive terminal sessions are used by this user group in a peak month, exercising which functional features of this system and what are the minimum, maximum and average lengths, in minutes, of the terminal sessions?

FUNCTIONAL FEATURE CLASSIFICATION	FREQUENCY OF ACTIVITY	# SESSIONS	SESSION LENGTHS IN MINUTES		
			MINIMUM	MAXIMUM	AVERAGE
Data Entry	_____	_____	_____	_____	_____
Data Collection	_____	_____	_____	_____	_____
Data Editing	_____	_____	_____	_____	_____
Data Reduction	_____	_____	_____	_____	_____
Data Update	_____	_____	_____	_____	_____
Data Processing	_____	_____	_____	_____	_____
Standard Reporting	_____	_____	_____	_____	_____
Ad Hoc Reporting	_____	_____	_____	_____	_____
Graphics and Plotting	_____	_____	_____	_____	_____
Other (Specify):	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Frequency of Activity Codes: 1=Daily, 2=Weekly, 3=Monthly

14. USER GROUP TECHNICAL INFORMATION (Continued)

- 8) How many batch, interactive or real time jobs are submitted by this user group in a peak month, exercising which functional features of this system and what are the computer usage statistics for a batch run by functional feature, please specify the minimum, maximum and average usage for the requested categories. For each functional feature, please provide the aggregate usage statistics for the peak month for the requested categories.

FUNCTIONAL FEATURE CLASSIFICATION	JOB ACTIVITY CODE*	#JOBS	SINGLE JOB STATISTICS-CDC MACHINE							
			CPTM (SECS)	PPTM (SECS)	IOTM (SECS)	CMIM (KWS)	CARD I/O	DISK I/O	TAPE I/O	PRINT I/O
Data Entry	Min									
	Max									
	Avg									
Data Collection	Min									
	Max									
	Avg									
Data Editing	Min									
	Max									
	Avg									
Data Reduction	Min									
	Max									
	Avg									
Data Update	Min									
	Max									
	Avg									
Data Processing	Min									
	Max									
	Avg									
Standard Reporting	Min									
	Max									
	Avg									
Ad Hoc Reporting	Min									
	Max									
	Avg									
Graphics and Plotting	Min									
	Max									
	Avg									
Other (Specify):										
	Min									
	Max									
	Avg									
	Min									
	Max									
	Avg									
	Min									
	Max									
	Avg									
	Min									
	Max									
	Avg									

* Frequency of Activity Codes: 1=Daily, 2=Weekly, 3=Monthly

8) (Continued)

[illegible]

15. APPLICATION SPECIFIC TRAINING

Please comment on the adequacy of the training provided for this application and identify who provides the training required. Is the quality of the training or the lack of formalized training a problem for the users of this application? Please identify and quantify any current and future application specific training requirements.

Comments:

16. APPLICATION SPECIFIC ADP SUPPORT

Please comment on the adequacy of the ADP support provided for this application. Please identify any hardware, software or telecommunications problems that existed in the past, exist now, or may exist in the future. These comments will be used to determine high priority ADP requirements because they impact current applications now. If possible, please assess the impacts of these problem areas on this application, addressing the past, present, and future.

Comments:

17. What hardware, software or telecommunications capabilities are required to improve the operation of this application? Please discuss the required capabilities.

Discussion:

18. What are the major problems with this application? Please discuss the major problems with this application.

Discussion:

19. What are the current and future plans for resolving the major problems with this application? Are there any enhancements or modifications planned for this application? What is the future for this application? Please discuss these issues regarding this application.

Discussion:

20. Please discuss the types of services that you would like MISD to provide regarding this application now and in the future.

Discussion:

Please express your opinions and impressions concerning this questionnaire, the conduct of the interview, the individuals conducting the interview, the requirements analysis or anything else your group would like to comment on. Your opinions, impressions, comments and criticisms are welcome. Please forward this sheet to Inter Systems Inc. in the envelope provided. Thank you for your inputs. If you wish to be contacted regarding your inputs, please indicate your name and phone number on this sheet.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

This completes the structural part of the interview concerning this application software system. Thank you for your time and cooperation. We will now open up the interview session for general discussion.

THIS IS THE END OF THIS SURVEY INSTRUMENT

USER LEVEL QUESTIONNAIRE

U.S. ARMY MICOM SCIENTIFIC AND ENGINEERING COMPUTER SUPPORT
COMPUTATIONAL CAPABILITIES REQUIREMENTS ANALYSIS

USERS QUESTIONNAIRE

JULY, 1985

PREPARED FOR:

UNITED STATES ARMY MISSILE COMMAND

BY: Inter Systems, Incorporated
7630 Little River Turnpike
Annandale, Virginia 22003
703-642-1600

and

Inter Systems, Incorporated
2614 Artie Street, Suite 21
Huntsville, Alabama 35805
205-536-8700

Please contact me for further inputs. YES NO

2. Please provide a brief description of your applications that require better computer hardware and software support.

APPLICATION

IDENTIFICATION

DESCRIPTION

3. Please list the hardware requirements needed to support your applications. Please include present and future requirements.

4. Please list the software requirements needed to support your applications. Include specific software packages, programming languages, training and any other needs.

5. ENGINEERING DISCIPLINES COMPUTER APPLICATIONS

Please circle all of the Scientific and Engineering disciplines that are currently supported by computer application programs in your organization. Please identify the number of Scientific and Engineering computer applications that you work with in each discipline. Please estimate the total number of Scientific and Engineering computer applications that currently exist in each discipline. Please estimate the number of new applications that will be developed over the near and long term.

SCIENTIFIC AND ENGINEERING DISCIPLINES	NUMBER OF APPLICATIONS			
	YOU WORK ON	CURRENTLY EXIST	NEAR TERM	LONG TERM
1. Aerospace and Aeronautical Engineering	_____	_____	_____	_____
2. Agricultural Engineering	_____	_____	_____	_____
3. Chemical Engineering	_____	_____	_____	_____
4. Civil Engineering	_____	_____	_____	_____
5. Computer Science	_____	_____	_____	_____
6. Electrical and Electronics Engineering	_____	_____	_____	_____
7. Fire Protection Engineering	_____	_____	_____	_____
8. Geotechnical Engineering	_____	_____	_____	_____
9. Human Factors Engineering	_____	_____	_____	_____
10. Industrial Engineering	_____	_____	_____	_____
11. Material Science Engineering	_____	_____	_____	_____
12. Mechanical Engineering	_____	_____	_____	_____
13. Medical Engineering	_____	_____	_____	_____
14. Nuclear Engineering	_____	_____	_____	_____
15. Ocean and Marine Engineering	_____	_____	_____	_____
16. Structural Engineering	_____	_____	_____	_____
17. Water Resources Engineering	_____	_____	_____	_____
18. Other (Specify)	_____	_____	_____	_____

5. ENGINEERING DISCIPLINES COMPUTER APPLICATIONS (Continued)

Please check the Professional/Technical Specialty areas within your organization that are supported by computer applications.

	C
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PROFESSIONAL/TECHNICAL SPECIALTY AREA	K
1. Automatic Test Equipment	—
2. Chemistry	—
3. Command & Control Communications	—
4. Computers	—
5. Configuration Management	—
6. Cost & Schedule Analysis	—
7. Electro-Magnetic Radiation	—
8. Electronic Components	—
9. Fire Control	—
10. Ground Support Equipment	—
11. Guidance and Control	—
12. Human Factor Engineering (HFE)	—
13. Industrial/Management Engineering	—
14. Lasers	—
15. Materials	—
16. Mathematics	—
17. Metrology	—
18. Missile Dynamics	—
19. Nuclear Effects	—
20. Operations Research	—
21. Optics	—
22. Particle Beam	—
23. Product Assurance	—
24. Propulsion	—
25. Radar	—
26. Risk Analysis	—
27. Safety Engineering & Management	—
28. Seekers	—
29. Systems Design & Development	—
30. Systems Simulation	—
31. Systems	—
32. Targets	—
33. Telemetry	—
34. Test and Evaluation	—
35. Facilities Management	—
36. Instrumentation	—
37. Infrared and Electro-Optical Sensors	—
38. Structures	—



7. SUGGESTIONS

Please provide your suggestions on approaches to resolving the problems that you have experienced. Your constructive comments are deeply appreciated.

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8. POINTS OF CONTACT

Please identify the individuals that you know who are heavy Scientific And Engineering Computing Users who might wish to contribute to this study effort. Please provide the person's name and title, organization, office symbol, building number, room number and phone number.

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Thank you for your time and cooperation. We sincerely hope that substantial improvements in the computing environment will be made, to the benefit of the Scientific and Engineering User Community, as a result of this study effort.

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